

Design and Fabrication of a THz Nanoklystron

Harish Manohara and Peter H. Siegel, JPL
Jimmy Xu and Baohe Chang, Brown University

Recently the authors proposed a novel monolithic tube approach to THz power generation: the nanoklystron. In this presentation they report design and fabrication details of 1200 GHz nanoklystron circuits and ongoing efforts to produce low voltage cold cathodes from carbon nanotube (CNT) emitters. Both silicon-based and metal nanoklystron cavities have now been completed, and measurements on the field emission properties of several CNT cathodes have been made. In addition new techniques for growing highly ordered CNT arrays on flat evaporated surfaces have been demonstrated for the first time. The presentation will include analytic design details for the 1200 GHz nanoklystron circuit, fabrication process steps for realizing the monolithic cavity, CNT emission measurements and progress on a UHV cathode test chamber.